

# Toward a Computational Model for the Automatic Generation of Character Personality in Interactive Narrative

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**Abstract.** This paper introduces an approach for the incorporation of interesting and compelling characters in automatically generated interactive narrative. The approach is based on the development of a computational model that enables virtual characters to have distinct and well-defined personalities. In this model, character personality is founded on the hypothesis that choices that lead to actions can be used in interactive narrative to significantly influence a character’s perceived personality.

**Keywords:** interactive narrative, planning, artificial intelligence

## 1 Introduction

In the area of Interactive Narrative (IN), the ability to generate character behavior that adjusts in response to user actions or changing story conditions has not been fully addressed by existing research. Models have been developed to direct character interactions [1], compose stories using predefined character models [2, 3], generate dialog based on personality traits [4], and control facial and physical gestures to express emotion [5–7]; however, none of these approaches focus specifically on controlling character behavior over time to elicit the perception of a distinct and well-defined personality.

Previous approaches have primarily addressed character personality by considering behavior at a very fine-grained level of representation. That is, these approaches focus on a character’s immediate reaction to stimuli. In contrast, our work focuses on the story as a whole and in particular the use of choices made by characters as a means to express their personality. We propose the creation of a model focused on physical actions and the role that these play over the course of a narrative in the construction of the mental model that the audience forms when experiencing it.

## 2 Character Personality Based on Choice

Considering narrative structure, specifically plot-points where branching occurs [8], we can intuitively expect the presence of actions that follow a choice. We

posit that the link between action and choice can be harnessed in an interactive narrative system, such as a video game, to facilitate the expression of personality in virtual agents. We base this idea on research in behavioral psychology that has found correlation between people’s actions and their personality traits [9, 10]. Our hypothesis is that audiences can form opinions about a character’s personality traits based on the choices that the character makes during the course of a story and the causal chain of events that contextualize such choices.

### 3 Modeling Choice in Planning-based Interactive Narrative

Our model aims at enabling the representation of a general subset of personality traits with enough detail to elicit a predictable cognitive response from the audience. We represent traits using a taxonomy based on the Big Five personality structure as defined by Goldberg [11]. The process for action selection uses a declarative approach in which character attributes are considered in conjunction with the story context to choose actions that best represent a character’s personality.

The implementation of the model extends a partial-order planning algorithm (e.g., POP [12]) to address narrative generation, similar to previous approaches developed by Young and his colleagues [13–16]. The key objective is to modify the process to ensure that choice is treated as a first-class object, i.e., the story structure and contents promote the existence of choices and make their existence evident to the audience. To accomplish this, actions are added to the plan after evaluating the context in which they are executed and examining the set of possible story plans. Context includes character and story attributes such as goals, beliefs, moral traits, relationships, story events, previous choices, and action effects. The result of the evaluation is a list of viable actions, ranked based on how closely they represent a character’s personality traits. For example, an agreeable character is more likely to obtain money by working than by robbing a bank.

### 4 Conclusion

Results from this research will be applicable to systems used to create IN due to the reduction of authorial burden and increased creative freedom that may be provided. A narrative generation system based on our model could produce multiple different stories based on simple changes to character personality traits. For example, if the personality of the *hero* of a story is modified from conscientious to non-conscientious the resulting story could be markedly different but the work of the author would only involve changing one of the character’s properties.

We are currently developing the algorithm for action selection and the process used to rank and place actions in the story plan. The model is expected to scale to complex domains and generalize to IN applications that include training simulations, activity visualizations, instructional video generation, and games.

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